

Challenging the digital imperative

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Challenging the digital imperative

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Challenging the digital imperative

Inaugural lecture

presented upon the acceptance of the Royal Netherlands Academy of Arts and Sciences (KNAW) Extraordinary Chair in Digital Cultures in Development at Maastricht University on 28 March 2008.

by

Sally Wyatt



Mijnheer de Rector Magnificus, lieve familie, vriendinnen en vrienden, beste collega's,

As you entered this building this afternoon, you may have heard, on loop, a recording of one of John Cage's most controversial works, four minutes and 33 seconds, or simply 4,33, composed in 1952¹. I wanted you to have a moment for quiet reflection, away from the noise of contemporary society, in which information comes at you from every direction. I hope you all enjoyed that, and did not get distracted by checking your text messages, making arrangements with colleagues, catching up with friends, wondering what the relationships of these people in the front row are to me and to each other. As homage to Cage, one of the great composers of the twentieth century, I did consider performing an inaugural lecture entitled maybe 44,33: standing here, occasionally turning a page, leaving you to wonder what I might have said, what was in the footnotes. For the many of you familiar with the lecture genre either as listener or as performer you could have reflected on the good, bad and indifferent lectures that you have given and/or heard. In the spirit of the times, each of you could have created your own individual experience within the material structure provided by this occasion. The advantage for me was that it would have been easier to get the timing right.

In the remaining 43 and a half minutes, I would like to do three things, as is often the case in academic lectures. First, I will talk about some of the work I have done in the past particularly about information and communication technologies and everyday life. Second, I will briefly reflect on the role of an inaugural lecture in the digital age. Finally, I will consider the implications of these first two sections for my work and that of the Maastricht Virtual Knowledge Studio, not only with my new colleagues in the Faculty of Arts and Social Sciences but also I hope with colleagues in other faculties at Maastricht University. Along the way, I will explain what is meant by the title of my special chair, 'digital cultures in development'.



I will begin with the word 'cultures'. Raymond Williams, the Welsh literary theorist, once wrote that '[c]ulture is one of the two or three most complicated words in the English language' (1976, p.87). This is due to its intricate development over the last centuries in several European languages as well as its different meanings in various intellectual disciplines. I will not use culture in the capital C, high art sense. Despite my reference to John Cage and despite the beautiful pictures accompanying the text, I am not academically qualified to talk about culture as music, painting, sculpture or literature. I use 'cultures' in the plural as a way of talking about the specific and changing traditions, norms, values, habits and practices of historical periods and countries as well as those of social, economic and professional groups that span place and time. It has the advantages of avoiding the imperialistic connotation of 'civilisation' and of enabling discussion and analysis of different cultures symmetrically.

Informing ourselves to death²

I originally studied economics, and even though I have moved outside mainstream economics to the extent that no self-respecting economist would now consider me to be part of that particular culture, economics is a very powerful discipline and there are things I learned during my studies that have remained with me. Paramount among these are that resources matter and that access to and distribution of resources amongst social groups matter even more. In this sense, I am a materialist. Social life is, if not determined, at least very much shaped by systems of production and reproduction.³ Thus, for me, moving into science and technology studies (STS) was not such a radical step, as the broad project of STS is to understand the ways in which facts, knowledges and technologies are made, and the important role of material practices in their making. Particularly in technology studies, the challenges remain: to understand how machines make history in concert with people (Marx and Engels, 1846/1965), the relationship between the often uneven social shaping of technology and technical shaping of society (MacKenzie and Wajcman, 1985/1999; Bijker, 1995; Bijker and Law, 1992) and to take the categories of social actors seriously, to treat symmetrically the categories of analysts and those of social actors (Wyatt, 2008). Digital technologies are very material. They include what many of us see and use every day: computers, mobile phones, bank machines and ticket machines. What is less visible to us as ordinary users but essential to the working and success of these technologies are cables, satellites, routers, servers and so on.



I am deeply sceptical of those claims by some economists, sociologists, philosophers and cultural theorists that we now live in a dematerialised or weightless society (Coyle, 1999; Quah, 2008; Jenkins, 2006). One can only marvel at the virtualism, a variety of idealism one could say, which enables people to deny the materiality of technologies simply because the infrastructure is underground or overhead or because much of the production of consumer and capital goods has moved to countries far away.

Almost ten years ago, I applied some of this sort of reasoning in order to reflect on the hype around the internet, the first dot-com boom. Together with colleagues at the University of East London, Graham Thomas and Tiziana Terranova, I started to think about non-use of the internet (Wyatt, Thomas and Terranova, 2002)⁴. At that time, the digital divide was a huge policy issue. Policy makers expressed concern about individuals, social groups, countries becoming socially, politically and economically excluded as a result of not being digitally connected. Data were already beginning to emerge in the late 1990s (Katz and Aspden, 1998) that not using the internet was sometimes a positive choice. We were not content with seeing non-use simply as a deficit, as a lack, as a problem to be solved. We wanted to question the conventional wisdom that everyone is a potential user just waiting for access. We came up with two dimensions, distinguishing between voluntary and involuntary non-use and between those who had never had access and those who had once had access but had, for whatever reason, lost it. This enabled us to develop four categories of non-use: resisters, rejecters, the excluded and the expelled. Resisters are those people who have never had access and never wanted it. Rejecters tried it but gave it up voluntarily. The expelled have had access at some point in time but have lost it, maybe through leaving formal education or changing jobs, but certainly loss of access was not of their choosing. The excluded have never had access, again not through their own choice. The excluded and expelled are the groups to whom policy makers and suppliers of technology aim their policies and sales pitches. We felt that the resisters and rejecters were being ignored but were nonetheless important in all sorts of ways. Even if one accepts the notion that digital inclusion somehow leads to social inclusion, understanding why some people choose not to use digital technologies in their current form could provide important insights for policy makers and suppliers. Maybe non-users find current applications to be neither useful nor fun, but some future, as-yet-unknown applications will bring them into the digital fold. In this way, non-users may



also shape the technologies of the future. But resisters and rejecters are more important for their challenge to the technological imperative (Ellul, 1964, 1980; Uitonon, 2003)⁵ in this case, to the digital imperative, to the idea that there is a single, digital logic for all individuals, organisations and countries. In other words, people who choose not to use digital technologies, remind us all that things 'might have been otherwise' (Bijker and Law, 1992, p.3). They remind us, in some cases, that digital exclusion does not always mean social exclusion. They also remind us to think carefully about what the expansion of the online world means for the offline world. Could it be that everyone's choices will be determined by the growth of digital technologies, whether or not people actively choose to take part in digitised interactions? As information and services such as banking become increasingly available online, will the possibilities for finding information or conducting one's financial affairs be limited? Most importantly for this chair called 'digital cultures in development', non-use, especially when it takes the form of resistance or rejection, is a reminder that the universalist claims, both the utopian and dystopian versions, about the diffusion of digital technologies may not be realised. Moreover, 'digital cultures' may take different forms in different locations. Network technologies span the globe, but the material and cultural meanings and uses vary between individuals, organisations, regions and countries. There is not a single trajectory. Thus, digital cultures are in development everywhere in the world, in Mombasa as well as Maastricht.

This early work on non-use was largely a thought experiment. Since then, others have taken up the empirical challenge. Two communication studies scholars did a large-scale survey of non-users in Germany (Riehm and Krings, 2006). The categories worked well with non-use quite evenly distributed across the four groups.⁶ A US survey found that over half of non-users are resisters or rejecters (Lenhart *et al*, 2003). A recent PhD in Flanders about young people's use of technology found that a significant group of young people think the internet is no longer 'cool', and they are busy with other adolescent pursuits (Broos, 2006).

The next step for me was also an empirical one, to study the everyday, the mundane, what people do, in all its fascinating detail. Since the mid-1990s, more attention has been given to users in science and technology studies, away from the traditional focus on design and development (Silverstone and Hirsch, 1992; Lie and Sørensen, 1996; Oudshoorn and



Pinch, 2003; Bakardjieva, 2005).⁷ In part, the inclusion of users is an attempt to overcome the problems associated with those approaches in science and technology studies that emphasise the powerful actors in producing technologies such as scientists, engineers, politicians, marketers and financiers. But, focusing on use to the neglect of non-use means we are in danger of uncritically accepting the promises of technology. Defining people as either producers or users, and sometimes both, confirms the technocratic vision of the centrality of technology. Use, as I have already suggested, needs to be seen in relation to non-use. Moreover, non-use is not the only practice that needs explanation. To be symmetrical (Bloor, 1973, 1976)⁸, use also needs to be explained, and should not be taken as the normal, taken-for-granted practice.

The problem for those of us who do research about the everyday is that everyone is an expert. If social science research confirms people's own experiences, it was trivial and a waste of taxpayers' money. If it challenges people's personal experiences, the public may simply assume it is wrong. Aware of this danger, I took the plunge together with Flis Henwood, a long-time collaborator and dear friend, and other colleagues at Brighton University to look at the ways in which middle-aged and older people found health information, and whether or not the internet made any difference to that.⁹ We focused on how people found and interpreted health information (Henwood *et al*, 2003), but we also gathered data about how people experienced the internet in their daily lives (Wyatt *et al*, 2005). This study produced much interesting data, but most importantly for my purposes here, it allowed us to develop further ideas about use and non-use, namely that people's patterns of use and non-use change over time and life circumstances; that some people experience a digital imperative and may feel guilty for not using digital technologies; that some people really do not like computers and express this strongly; and that just because people live in a house with one or more computers, they do not necessarily use them.



To illustrate the complexities of health information exchange let me give a fictionalised example, based on this and other research¹⁰. Jane has been taking hormone replacement therapy (HRT) for five years, and it has made her feel much better, relieving the most acute symptoms of menopause. A friend recently gave her a copy of a popular women's magazine in which there was an article about different treatments for menopausal symptoms. The article discussed some of the risks associated with taking HRT, including an increased chance of breast cancer. Jane visits her family doctor for her regular check-up and a repeat prescription but she also wants to know what he thinks about the long-term risks of HRT. While at the doctor's office, the nurse performs a breast examination and gives Jane some leaflets about it. Jane is especially concerned as her sister was recently diagnosed with breast cancer, and she has been spending a lot of time with her sister recently. There are several types of mediation going on here: between Jane and her friend, between Jane and her sister, between Jane and the doctor and nurse, between Jane and the leaflets and the magazine article. The leaflets were prepared as part of a national health education campaign. The article was written by a journalist, living hundreds of kilometres away. The article conforms to the magazine's editorial policy about how to report research results, a policy which is different from that of the *Journal of the American Medical Association*, which Jane does not read. The situation becomes more complex when Jane sees a chat show on TV where a famous actress talked about how HRT had changed her life. Jane goes online to look at some of the websites mentioned in the magazine article, in the leaflets she received from the nurse, and at the end of the chat show. From those, she starts clicking and linking, what we now call 'googling'. When she tries to do this again with a friend in her local library, she cannot find some of the information she had found when using her computer at home. The local library has installed filtering software on its public access computers to prevent children from encountering pornography and sex education information, but neither Jane nor some of the librarians are aware of the presence of the software or its impact on access to health sites, arising because health and pornography share an interest in the human body. This simple example illustrates how old and new technologies (in this case, magazines, leaflets, television, internet, computer software) as well as places (the home, the library, doctor's office) can play a role in mediating health information. Technologies, people and places mediate information and people's understanding of it. The ways in which they do so are more or less visible to those looking for information.

In a forthcoming book, edited together with Roma Harris and Nadine Wathen (Wathen, Wyatt and Harris, in press, 2008), we use the term health 'info(r)mediary' to refer to people, as well as various configurations of people and technologies, that perform the mediating work involved in enabling health information seekers to locate, retrieve, understand, cope with and use the information for which they are looking. This is consistent with the way Bruno Latour (2005) uses 'mediation', as we share his emphasis on and interest in the transforming and also the distorting power of mediators. His use of mediator is quite general, and by adding 'info', we signal our focus on the mediation of (health) information. For us, infomediation refers to the inevitable, if not always predictable, transformation that occurs as information is conveyed from one place, person or situation to another. Info(r)mediation, however, is used to draw attention to those situations in which the human mediators convey information in order to effect change in the behaviour or actions of those looking for information.

What is next for the theoretical and empirical analysis of non-use and mediation? First, it is clear that non-use is still an issue globally, nationally and locally. The Netherlands may have 739 internet users per 1000 people, but the global average is only 136 and for the least developed countries in the world it is 12 (UNDP, 2007). The digital divide remains, even if it has slipped down the policy agenda, especially in rich countries and regions like the Netherlands and Europe. Second, a sensibility for non-use reminds us to be sceptical, for example, to be wary of the hype currently being manifested around Web 2.0, the label given to relatively recent applications such as blogs, wikis and social networking sites.¹¹ Third, we need to develop a more dynamic and nuanced conceptual framework. Rather than seeing use and non-use as an either/or choice, users of digital technologies need to be conceptualised along a continuum with degrees and types of involvement that may change, depending on education, jobs, children and moving house. The categories also need to be refined, to include not only rejection and resistance but also forced use, reluctant use, partial use, and what Nelly Oudshoorn (2008) calls 'selective use'. I will return to what all of this means for the work of the Maastricht Virtual Knowledge Studio but first a brief intermezzo to reflect on the role of the inaugural lecture in a digital age.

The inaugural lecture in the age of digital reproduction¹²

The inaugural lecture as performed in European universities is a purified (and perhaps sometimes parodied) form of the traditional university lecture in which someone stands up in front of a group of people and talks. Ideally this someone is both knowledgeable and audible, but not always. Sometimes there is an opportunity for questions, but not today. Why do we continue to do this in universities? You could read the text, download the podcast, look for the video clips that may appear on YouTube or, more likely, on the website of the Virtual Knowledge Studio.

The lecture is a difficult genre. I always say to students that I cannot possibly tell them everything they need to know in a one-hour lecture, which is maybe six to seven thousand words, a short academic article. My task in a lecture is to stimulate students to think and to read, and to read more than the PowerPoint presentation, seen by some as the essence of a lecture and thus all they need to know. I cannot really expect you to leave this lecture full of ideas about further reading, but I can hope that something I say today may prompt you to think about the world a little bit differently.

The inaugural lecture is an especially difficult instance of the genre. An ordinary university lecture has a clear pedagogical purpose, whereas an inaugural lecture has two goals, according to the booklet I received when appointed (*College van Decanen*, no date, p.5), namely to explain something about my own research and to indicate what this means for the university community with whom I shall be working in the future. An inaugural has a more diverse audience than an ordinary lecture, including colleagues from near and far in both geographical and disciplinary terms as well as friends and family. The fear for the orator is that colleagues are thinking ‘not this again’, ‘doesn’t she have anything new to say?’, or about the section still to come, ‘that is way too programmatic – ideas about future work are easy’. Colleagues from different disciplines and friends and family unfamiliar with this weird culture we call academia are quite possibly thinking ‘what on earth is she talking about’ or ‘who cares?’ The only person present who might possibly think that every word I utter today is wonderful is my mother.

Another role of the inaugural lecture is to acknowledge one’s intellectual debts, but then 45 minutes is not long enough, so you will have to read the text, including the footnotes and the bibliography.



The fact that I want students to read and that I suggest you read the text of this lecture does rather give the impression that I value the written word, probably not an unusual belief for a professor. But it was not always so. Socrates was very dubious about the value of the written word. He feared that if people had access to it, they would become superficial, have short attention spans, be unable to create anything original, have access to the wrong information and would no longer have real interactions with real people. Even worse for Socrates, the 'wrong' people might get access to the written word. He was not a democrat. We only know this because Plato took the liberty of mediating what Socrates said by writing it down. (Plato, 1988)¹³ More or less similar and more or less sophisticated versions of these arguments have appeared with the introduction of every new information technology over the past 2500 years.

But Socrates did not foresee the potential for written dialogue, just as future generations did not always foresee the potential of the printing press, the telegraph, radio, television or the internet. I often struggle with finding a term for what it is I do. Scholarship feels both pretentious and intimidating, and whether or not what one does constitutes scholarship is best left to the judgement of others. Science still feels wrong in English, even after years of living in the Netherlands, and getting used to its broader scope in Dutch and every other European language. Knowledge production is beyond pretentious when one uses it to describe what one does every day though it can be a useful analytic category. Academic work is just about acceptable and at least it draws attention to the fact that it is indeed work, though like much work includes a great deal of pleasure. I have always most liked the notion of 'dialogue' to capture the important aspects of what happens in research, teaching, writing and discussing. We enter into dialogues with many people, across time and space, with the dead through their writing, with the living through teaching, presenting, discussion, and, if we are lucky, with both the living and the unborn, through our own written texts. Dialogue makes clear that the process is ongoing, unfinished and unfinishable. An inaugural lecture, however, is hardly a model of spoken dialogue, as the Dutch word *oratie* makes abundantly clear. At the *Dies Natalis* of Maastricht University earlier this year, the Rector called for a more interactive form (Mols, 2008). Remember, the Rector, or his representative, is often here on Friday afternoons, sitting through what must sometimes feel to him to be interminable lectures on every topic imaginable, and



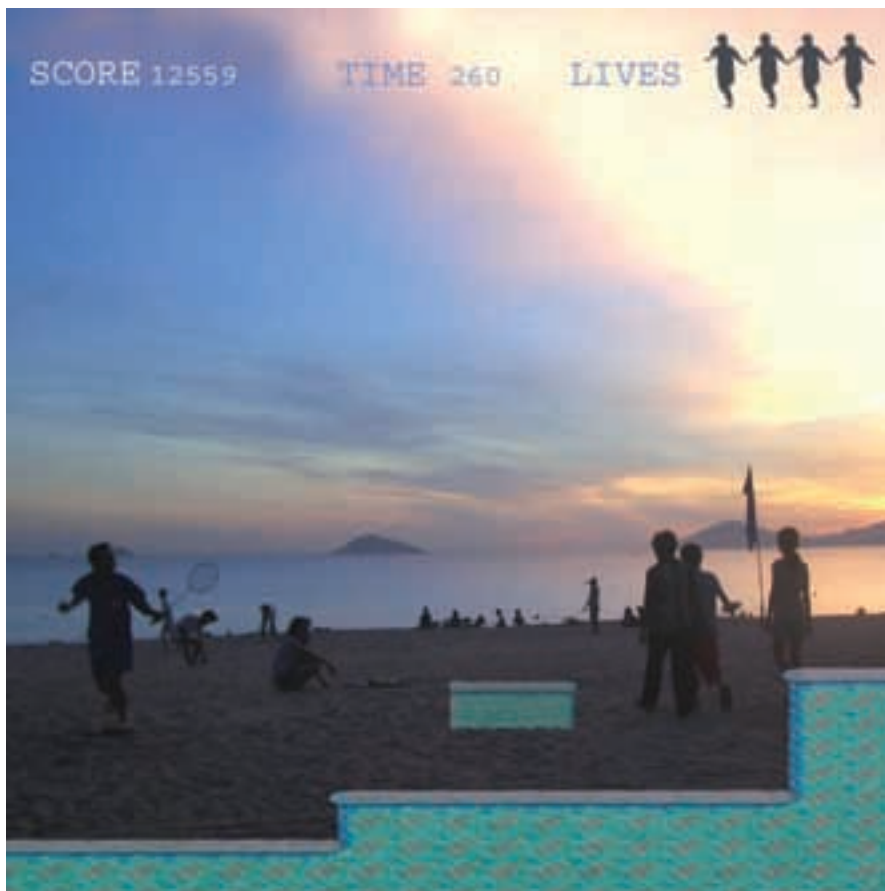
for that he deserves our sympathy. But I think his call for more interaction may also be a sign of the digital imperative, that every event has to be fast and interactive. Interaction does not always have to be face-to-face or synchronous; the written version of this text is also part of an academic dialogue.¹⁴ On bad days, I think maybe Socrates had a point, that the world is becoming saturated with trivia. The inaugural lecture can also be seen as an assertion by universities of their traditional role as places to sit quietly, to listen, to think, to reflect. (Pels, 2003)¹⁵

I began this section by saying the inaugural lecture was a purified form of the lecture, but actually it is more of a hybrid knowledge form. It is both a spoken and written text. It is aimed at one's academic peers and also colleagues from other disciplines as well as a broader public. It is simultaneously a performance of individual authority and an acknowledgement that knowledge is produced within networks. It is also a public performance, making me accountable, and in that way is akin to the seventeenth century public experiment with you as the collection of 'gentlemen' vouching for my veracity¹⁶ (Shapin and Schaffer, 1985). It includes different representations of knowledge, a topic I will say more about in the next section.

Where is the insight we have lost in factoids?¹⁷

So far I have reflected on the digital imperative, on the everyday use and non-use of digital technologies, on the ways in which health information is mediated and on the inaugural lecture as a form of knowledge representation and performance. What does all of this mean for the Maastricht Virtual Knowledge Studio?¹⁸

Within universities, we sometimes see ourselves as slow to take up the possibilities offered by new internet-based technologies, lagging behind those innovative leaders in financial services, the games industry and the for-profit side of pornography. History suggests differently. Universities and researchers were fundamental to the development of digital culture. What we now call the internet has its roots in ARPANet (Advanced Research Projects Agency Network) (Abbate, 1999). The Cold War conspiracy view tends to dominate current histories of ARPANet and the internet, in which investment in a robust communication infrastructure was needed in case a hot war started. A more boring and more plausible view is that the US Department of Defence wanted to develop networking possibilities in order to reduce the capital expenditure on super computers within US universities.



This latter view is more consistent with the historical record. The protocols and language of the World Wide Web were first developed by Tim Berners-Lee while he was working at CERN (European Organisation for Nuclear Research), a publicly-funded research centre. In the current hype around Web 2.0, we should remember that university libraries have been full of user-generated content for centuries. The manuscripts, books and journals which fill library shelves are largely produced by scholars for scholars. In the 1970s and 1980s, there were alternatives to the internet, other ways of communicating data across distance. One reason the internet succeeded while commercial networks eventually failed is that the internet's creators were people committed to academic norms of sharing and openness. (Castells, 2001; Thomas and Wyatt, 1999)

Within the Virtual Knowledge Studio, we are interested in the development of research infrastructures, like the internet mentioned above, and more generally we are concerned with the relationship between the material conditions of knowledge production and the nature of the knowledge produced within social sciences and humanities. My colleagues, Paul Wouters and Anne Beaulieu (2006), have explored the development and adoption of e-science tools, and emphasise the dangers of building infrastructures and tools based solely on the needs of the natural sciences or, worse, based on no understanding of user needs at all. The term 'virtual knowledge'¹⁹ captures very succinctly the changing role of knowledge – of both lay people and experts – in an information society where ontological and epistemological insecurity are increasing and the age-old problem of the double hermeneutic in social science is getting worse. I doubt the previous sentence meets the requirement in the instructions given to new professors (*College van Decanen*, no date) not to speak in code, otherwise known as disciplinary jargon, so I shall try again in the paragraphs below, by explaining what is meant by the double hermeneutic, the information society and the digitisation of knowledge.

Within philosophy, the 'double hermeneutic' refers to the problem that social scientists have in dealing with the interpretations of social life produced by social actors themselves as well as the interpretations of social life produced by analysts. For example, to be a good sociologist or economist or anthropologist you not only need to know what your fellow sociologists, economists and anthropologists mean by the 'family', 'paid work' or 'national identity', you also need to know what parents, workers, immigrants and policy makers mean by those terms.

Anthony Giddens (1984), the British sociologist, has a slightly different twist on this, and one I have always found useful. He draws attention to two processes. First, social scientists need to find ways of understanding the world of social actors. Second, social scientists need to understand the ways in which their theories of the social world are interpreted by those social actors. Returning to the example, not only do social scientists need to know about how social actors understand terms like 'family', 'paid work' or 'national identity', they also need to pay attention to the ways in which meanings and definitions circulate between social science and the social world, primarily via mass media and education.

The 'information society' has received a huge amount of scholarly and policy attention since the publication of Daniel Bell's *The Coming of Post-Industrial Society* (1973). For Bell, the key features of an information society are: a large and growing proportion of national output is accounted for by information processing; the majority of the labour force is composed of information workers and information is the key commodity of exchange and value. More recently, Manuel Castells (1996-98) has argued that the 'informational mode of development' is significantly different from the industrial mode which preceded it. In particular, Castells focuses on the 'network of flows' and what this accelerated circulation of information means for the material basis of society. The availability of huge amounts of information and its flattening, in the sense that it all looks much the same and it becomes difficult to know what to trust or believe, leads to a state of anxiety (Lash, 2002; Nettleton and Burrows, 2003) for academics and everyone else. In the Netherlands, if you have a loyalty card with the largest supermarket, you can check online what you have bought over the past year. Imagine aggregating the purchases of everyone with such a loyalty card. That information is valuable not only to the supermarket and advertisers but also to social scientists, interested in the consumption patterns of Dutch people. It is also interesting for Dutch consumers, who can then compare themselves to the peanut butter-eating norms of the nation, and adjust their consumption accordingly. Such detailed data would have been simply too time-consuming and expensive to collect in the not-too-distant past. All sorts of digitised information are being produced – not only marketing data and the myriad possibilities for categorising it, but also images, archives, blogs, and tags on all of these. We are living in what some call a 'software-saturated environment', an informatisation of places and of social groups, providing many opportunities for categorising, profiling and targeting people as citizens, consumers, patients, passengers, and so on.²⁰

The boundaries between knowledge producers and consumers are blurring. The boundaries are also blurring between data produced by scholars and that produced by governments, private companies and the 'crowd', for example in databases or on wikis. To paraphrase T.S. Eliot, the inspiration for the sub-title of this section, how do we make knowledge from this explosion of information? This raises anew one of the fundamental insights of science studies. Bruno Latour uses the term 'factish' (combining fact and fetish) to point to the ways that both scientific knowledge and religious belief are fabricated. He argues that both have to be well made in order to be epistemologically or morally defensible. The key question for Latour (1987, 2005) is not 'Is it real or is it constructed?' but 'Is it constructed well enough to become a stable or robust fact that can travel?' This question becomes even more pressing with the easy circulation of 'factoids', those statements that become accepted as true by virtue of being repeated often enough (see endnote 17).

Returning to Socrates' concerns about the written word, contemporary scholars have also expressed concern about how expert knowledge becomes reduced to information, how all information can seem to be equal when mediated by information technologies (Strathern, 2000; Lash, 2002). I am not interested in the ways in which cultural pessimists use such ideas to idealise some imagined past and lament the loss of authority of intellectual elites or of religion. I am interested in what digitisation means for what counts as valid knowledge within and between academic disciplines, within and between social spheres such as politics, healthcare, transport and cultural heritage. A key question is whether the digitisation of knowledge attracts new producers of knowledge as well as new publics. Over the past fifty years, it has become remarkably easy for zeros and ones to travel in material and practical terms, to travel across distance, across discipline, across social domain. As those zeros and ones are converted into text and numbers and pictures and sounds, how do people make sense and meaning? These questions are relevant to Jane, wanting to know whether or not she should take a particular drug. They are relevant, for example, to transport policy makers wanting to decide whether or not to build a tunnel, who have access to models produced by transport economists, surveys produced by market researchers and websites and blogs maintained by environmental activists. These questions are crucial for all of us associated with the Virtual Knowledge Studio as we want to understand not only our own practices but also those of everyone involved in the production, distribution and

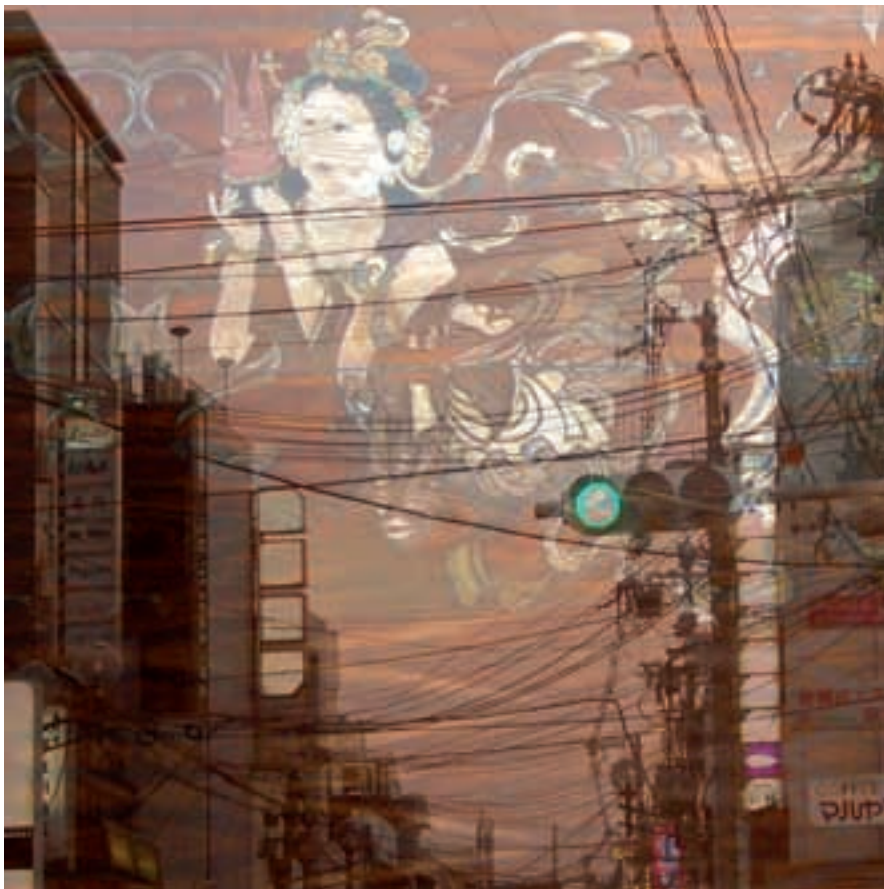


interpretation of knowledge. These are questions which need to be tackled both theoretically and empirically – in Maastricht and elsewhere.

The Maastricht Studio will begin with two projects. The first focuses on the ways in which different academic disciplines and different social actors develop and use knowledge generated by simulations. Simulations are becoming increasingly sophisticated and are often used for making decisions about technological systems. What kinds of knowledge do simulations provide? Is it appropriate to use that knowledge for making decisions that will have major societal consequences? These are the sorts of questions Matthijs Kouw will address in his PhD research in the coming years. The second project builds on ongoing work within the University by Pieter Caljé, Charles van den Heuvel, Jack Post and others, about the cultural heritage of Maastricht in which citizens and experts use digital technologies to collect and store memories of the city. How can user-generated digital archives be constructed and stored so that they are useful for future historians and city planners? What are the relationships between expert users, citizen users and the available technologies? Can new representations be created, opening up new perspectives on the city of Maastricht? Bas van Heur will begin to address these questions in April 2008.

One of the dangers we in the Greater Virtual Knowledge Studio (Amsterdam, Rotterdam and Maastricht) face is of being seen as champions of new research methods and techniques; that by studying the new it is assumed we endorse it uncritically. This is a familiar problem to those involved in science and technology studies, particularly those studying new and emergent technologies, whether it is nanotechnology or genetics. The challenge is, as Steve Woolgar (2002, p.9) explained in relation to information and communication technologies, 'to find a way of interrogating the terms of the debate without disengaging from them altogether'; in other words, to find a way of balancing academic caution with pragmatic urgency about changes in knowledge production.

The label 'studio' was chosen for a reason, to emphasise the importance of experimentation, of different kinds of interactions and structures than suggested by the more conventional university designations of 'lab' or 'centre' or 'department'. An important dimension of this, visible in the two projects I just mentioned, concerns the possibilities for new ways of representing knowledge such as in simulations, archives, blogs, as well



as in art, returning to culture with a capital C. These new forms of representation are not only important to study and analyse but also to experiment with ourselves, as Mecky van den Brink, Caroline Nevejan and I have done in the production of the pictures accompanying the text.

Do not misunderstand me. I am not saying that new information technologies are not important or interesting. New forms of data collection, storage, exchange, representation as can be found in dynamic databases, simulations, archives as well as new communication possibilities such as social networking sites and other collaborative platforms offer exciting opportunities for researchers to interact with one another as well as with broader audiences. But it is not the task of the Virtual Knowledge Studio to promote their uptake and increase the vendors' profits. Our task is to look at what these things mean for the production of knowledge and the work of researchers. My earlier work about health information seeking raises interesting questions about the mundane and everyday which can be applied to the academic context. Email, word processing and online searching have probably had the most profound effects on the work of those in the humanities and social sciences over the past 20 years. What do these mean for the ways in which knowledge is generated and shared? How are scholars, a paradigm case of 'knowledge workers', coping with the explosion of information early in the twenty-first century?

I shall conclude the substantive part of this lecture by returning to two points I made earlier, about materiality and non-use, and what they mean for the research agenda of the Greater Virtual Knowledge Studio. By retaining a position of analytic scepticism and challenging the digital imperative, it becomes possible to develop new research questions around digital cultures in development.

The materiality of the digitisation of knowledge means that the following five issues demand attention. First, it is important to understand the political economy of the industry which provides crucial elements of research infrastructure, hardware and software. Powerful corporate interests are being brought into the university and other public research cultures through investment in technical infrastructures. Second, research technologies are not neutral tools. The design of search engines and databases as well as of more innocent-seeming software for word processing and presentations has implications for the ways in which knowledge is produced and represented.

Third, and related to this, new and old forms of knowledge representation are not neutral. What kinds of knowledge are rendered in/visible with databases, models and simulations? What are the ethics and politics of representation? What kinds of information can and should be preserved? Just because it is easy to save digital information, should we always endeavour to save it? Under what conditions would it be desirable to let some information disappear, to be ephemeral? Fourth, what are the implications of new research infrastructures and techniques for the distribution of skills and resources amongst researchers, within and between countries and disciplines? If a new knowledge landscape is emerging, who are the winners and losers? Finally, returning to the earlier point about the balance between enthusiasm and scepticism for the new possibilities, what needs to be stable and when? Sometimes as researchers we want the technological tools to be fixed, at least temporarily, so that we can work with them and explore their potential. At other points, we may want to re-open the 'virtual black toolbox' in order to understand what new tools might mean for the production and nature of knowledge.

This brings us back to non-use and the digital imperative. As new research tools become more widely diffused, what happens to those scholars who do not use them, voluntarily or otherwise? Will they experience difficulties in doing research, at each step of the process, from making grant applications, accessing literature, gathering data and publishing results? Just as the digitisation of the everyday life world in countries such as the Netherlands makes it increasingly difficult to organise one's financial affairs or travel on public transport, will the digitisation of the research process make it more difficult for those scholars who do research differently from what might be called the digital norm? The digital imperative is real in its consequences and that is why it needs to be challenged, both analytically and in practice.

In grateful acknowledgement²¹

I have had a long career, in different countries and institutions, so I cannot possibly thank adequately all of the individuals who have shared their knowledge and ideas with me over the years. But I would like to take this opportunity to acknowledge some of my greatest debts.

I would like to thank the Rector Magnificus and the *College van Bestuur* (Executive Board) for the great honour of being an 'extraordinary professor' in this wonderful university. I am also grateful to Rein de Wilde, both personally and as the Dean of what has always been my fantasy faculty. My first introduction to the faculty was through three wonderful people, Rein, Jessica Mesman and Wiebe Bijker, in conjunction with the establishment of the ESST programme in the early 1990s. The connection continued, still from a distance, with Wiebe as my PhD supervisor. From afar, the Faculty has always seemed to be full of fascinating people. The amazing thing is that now that I come here every week, I find that to be true, and even better, there are even more fascinating people in the Faculty and elsewhere in the University.

Most PhD students at a certain point need to separate from their supervisors, and often this is quite violent. Academics can be vicious in ways that may be hard for outsiders to understand: the lack of citation or acknowledgement is far more painful than properly-cited intellectual disagreement. I have never experienced that oedipal moment in relation to Wiebe. I remain grateful for and amazed at his intellectual generosity towards me and so many others. I only hope that now we are colleagues I can begin to offer him some of the help and support he has always so kindly offered to me.

My main job remains with the Amsterdam branch of the Greater Virtual Knowledge Studio, a term that Paul Wouters, the Director, sincerely hopes will catch on. I am very grateful to the Royal Netherlands Academy for Arts and Sciences (KNAW – *Koninklijke Nederlandse Akademie van Wetenschap*) not only for their financial support for my 'extraordinary chair' and the Maastricht Virtual Knowledge Studio but also for their financial and intellectual support for the Studio as a whole. It is an extraordinary group of colleagues, and I feel privileged to work with them.



My third job is with WTMC (*Wetenschap, Technologie en Moderne Cultuur*), the Netherlands Graduate Research School of Science, Technology and Modern Culture. It is fantastic to work with PhD students from around the country, and to be part of the Dutch STS community. *Er is geen beter land ter wereld om 'STSer' te zijn. Het is echt een wonder dat Nederlands niet de voertaal van STS is.*²²

One of my great pleasures in the preparation for this event was working with Caroline Nevejan and Mecky van den Brink to produce these amazing pictures. Mecky is the artist but Caroline provided the crucial translation work: some Dutch-English translation but mostly the far trickier translation between the visual and the word. Both my text and Mecky's images were produced and stored digitally. That does not make them the same. Luckily.

I can almost see the speech bubbles over the heads of my mother, brother and sister: 'This child wittered on when she was six, and here she is still wittering on, getting dressed up in a long red gown, and people are paying her to do it! Unbelievable!' Family is important, not least because they are the people who knew you as a child. I am delighted that they are here today.

As that small person, growing up in Canada, I did not dream of moving to a small, flat country²³, to live in a house below sea level, to work in a university that did not yet exist, *en een heel moeilijke taal te leren*²⁴. But here I am, and the reason for that is Hans. Sociologists have a bad habit of making up rules (Durkheim, 1895/1982; Giddens, 1976/1993; Woolgar, 2002), of making things more complicated than they are, some would say. Hans sometimes describes himself rather disingenuously as a 'simple' philosopher. Together with this wonderful simple philosopher, or simply wonderful man, I have learned that in love only one rule matters. *Dank je.*

Like John Cage's 4,³³, I hope that today's event has offered more in performance than is provided by the score, so that you can say to others 'you had to be there'. Although there is no opportunity now for dialogue, I hope that there will be in the future, including the future which is now. It is time for a drink, it is time for discussion, it is time for noise.

*Ik heb gezegd.*²⁵

Acknowledgements

Hans Radder, Paul Wouters, Caroline Nevejan, Wiebe Bijker and Marianne Franklin generously made time to discuss ideas about this text and/or provide comments on earlier drafts. I am grateful to them all. For an inaugural lecture, even more than usual, responsibility for mistakes of fact, value and interpretation is mine.

Notes

- 1 The piece consists of three movements. It was first performed with piano, but the score indicates it is for any instrument or any combination of instruments. The piece reminds listeners that there is always sound and it remains a challenge to the definition of music. There are many recordings and it has occasionally been broadcast live on both television and rather more daringly on radio (when BBC Radio 3 did this in 2004 it had to turn off the emergency system that would normally have cut in during such a long silence). A recording of David Tudor, the pianist who first performed the piece in 1952, can be found on YouTube: <http://www.youtube.com/watch?v=HypmW4Yd7SY&feature=related>. An orchestral version is also available: <http://www.youtube.com/watch?v=hUJagb7hLoE> (both accessed on 2 March 2008).
- 2 With apologies to Neil Postman for borrowing from the title of his important book *Amusing Ourselves to Death* (1986) in which he argues that television is transforming public affairs into entertainment. I am not concerned here with the entertainment possibilities offered by internet-based technologies but more with the information and knowledge aspects.
- 3 This is the historical materialism of Marx (1867/1976). Metaphysical materialism is the idea that only matter exists and it exists in space and time. The common sense notion of materialism is akin to consumerism. Science and technology studies is concerned with the materiality of scientific and technological practices, but not exclusively as attention is also given to the symbolic and semiotic aspects of science and technology. See Dirksen (2007) for a good example of how technologies and ideas and expectations about technologies shape organisational practices in a technology-intensive firm.
- 4 That project was entitled, 'From the Net to the Web and Beyond: Actors and Interests in the Construction of the Internet' (grant number L132251050). It was funded under the auspices of the Virtual Society? Programme (1997-2002) of the British Economic and Social Research Council. The Programme was directed by Steve Woolgar. More information can be found at: <http://virtualsociety.sbs.ox.ac.uk> or in Woolgar (2005).
- 5 See also the website of Uitonon's and others current project, 'Encounters with Technological Imperative', University of Joensuu, Finland: <http://www.joensuu.fi/tietoyhteiskunta/etim.htm> (accessed 3 March 2008).
- 6 Riehm and Krings (2006) refer to a survey conducted in 2004, at which time 45% of the population were non-users, of whom 35% were resisters; 25% rejecters; and 20% each excluded and expelled.
- 7 This work on users within STS draws, often implicitly, on De Certeau (1984) and Bourdieu (1984) who introduced important ideas about tactics, practices, appropriation, domestication, resistance. For explicit use of De Certeau in understanding how people incorporate the internet into everyday politics, see Franklin (2004). Another approach, drawing on communication studies, to studying online politics can be found in Witschge (2007).

Van Doorn *et al* (2007; in press 2008) and Kennedy (2005, 2006) adopt a different approach to understanding everyday identity performance online and offline, drawing more on feminist cultural theory though also taking technological affordances seriously.

- 8 Symmetry is one of the four principles of the Strong Programme in the Sociology of Scientific Knowledge. It is called 'strong' because of its commitment that all types of knowledge should be treated symmetrically. Bloor (1973, 1976) claims that truth and falsity need to be explained in the same terms. This is the principle that has had most attention within other theoretical developments within STS, such as Pinch and Bijker (1984) on working and non-working artefacts; Callon (1986) and Latour (1987) on human and non-human actors. The other three principles relate to impartiality, causality and reflexivity.
- 9 This project was entitled 'Presenting and Interpreting Health Risks and Benefits' (grant number L218252039) and was funded jointly by the British Economic and Social Research Council and Medical Research Council under their 'Innovative Health Technologies' Programme (2000-5), directed by Andrew Webster. For more information, see: www.york.ac.uk/res/ihl or Webster (2006).
- 10 While this story is fictional, it is based on previous work about the ways in which women inform themselves about the symptoms and treatments of menopause, especially HRT (Henwood *et al*, 2003; Wathen, 2006a; Wathen, 2006b; Wyatt and Henwood, 2006). This paragraph and the next one are adapted from the introduction to Wathen, Wyatt and Harris (in press, 2008, pp.2&6).
- 11 The hype around Web 2.0 is reminiscent of that around Web 1.0, and the critique also remains the same. It is not my intention to engage in that critique here, but Van Dijck and Nieborg (2007) do a good job of debunking some of the wilder Web 2.0 claims.
- 12 This time my apologies go to Walter Benjamin for borrowing from the title of his highly influential essay, 'The work of art in the age of mechanical reproduction' (1936/1973) in which he argued that mechanical reproduction would liberate art from place and ritual.
- 13 Some of the ideas in the dialogue between Socrates and Phaedrus are explored in the 1970s' cult classic, *Zen and the Art of Motorcycle Maintenance* (Pirsig, 1974), including many ideas about the role of technology in late twentieth century life.
- 14 Thompson (1995) draws attention to differences between face-to-face interaction, mediated interaction (letter writing, telephone) and mediated quasi-interaction (mass media). He highlights the dialogical nature of the first two and the greater range of symbolic resources available in face-to-face interaction. While this can be useful for analysing changes in the time-space dimensions of different media, Thompson idealizes face-to-face interaction for its richness and clarity. Thompson's distinctions are reminiscent of Innis' (1950, 1951) pioneering work on media, communication and power, in which Innis distinguishes between time-biased and space-biased media. I do not privilege face-to-face interaction in the way Thompson does. In our forthcoming book (Wathen, Wyatt

and Harris, in press, 2008), we demonstrate that even if personal health experiences are being communicated face-to-face, they are also being mediated, in Latour's sense of the information being transformed, translated, or even distorted.

- 15 An inaugural lecture is an example of what Nevejan (2007) means with YUTPA, 'being with you in time, place and action', and specifically the 'you-now-here' nexus. She uses YUTPA to analyse different human-technology interactions, drawing attention to the social and technical mechanisms which have to be in place for trust to be able to operate across all the combinations of you-not you; here-not here; now-not now.
- 16 I am grateful to Paul Wouters for pointing out this parallel between the contemporary inaugural professorial performance and that of seventeenth century scientists.
- 17 My final inspiration for a sub-title comes from the unlikely combination of T.S. Eliot and Norman Mailer. During discussion of the emergence of the information society in the 1980s, the following lines from Eliot's *The Rock* (1934) were often cited: 'Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information?' The preceding and following lines make it clear that Eliot was lamenting scientific and technical progress as, in his view, more activity, words, information and noise meant that people lost touch with stillness, silence, death and faith. Mailer is credited with coining the word 'factoid' to denote a fact that had no existence prior to appearing in the media. Factoid is defined in the *Oxford English Dictionary* as 'an assumption or speculation that is reported and repeated so often that it becomes accepted as a fact: a simulated or imagined fact'. Factoid is also sometimes used to refer to true but trivial information.
- 18 The Virtual Knowledge Studio (VKS) is a research institute of the Royal Netherlands Academy of Arts and Sciences. It has core funding for five years, 2006-10, and its 'head office' is in Amsterdam. The VKS is a place where we study how digital knowledge is being produced, represented and used. We are interested in what increasing digitisation means for the nature and status of knowledge; for the ways in which researchers conduct their work; and, for the ways in which social actors of all sorts interact around epistemic objects. The VKS is also a place for academics in the humanities and social sciences to experiment with new ways of producing and representing knowledge. VKS researchers not only conduct research themselves but they also engage in the following activities: cooperate with university-based colleagues to develop new research; provide facilities for visiting senior and junior scholars; organise workshops; make presentations; supervise masters' and PhD dissertations. To facilitate cooperation with Dutch scholars, two campus sites have been established, one at Erasmus University in Rotterdam and the other at Maastricht University. For more information, see www.virtualknowledgestudio.nl.
- 19 I have attempted to use the adjective 'digital' in this text despite the use of 'virtual' in the name of the VKS. Digital is arguably a more neutral descriptor to capture those things that happen in places we cannot see, such as the online storage and distribution

of data and information. Virtual also captures that but adds a tantalising twist as it also suggests 'being in essence or in effect'.

- 20 For an excellent collection of essays about these possibilities in relation to cities, see the special issue of *Information Communication & Society* (Ellison, Burrows and Parker, 2007).
- 21 This spoken acknowledgement of about five minutes is standard practice during an inaugural lecture in a Dutch university. It is often when people start to pay attention, to hear who is included, and who not. It is also a sign that it is almost over and that drinks are imminent.
- 22 English translation: 'There is no better country in the world in which to be an STSer. It is a mystery why Dutch is not the working language of STS.'
- 23 Canada is more than 9 million square kilometres and has a population of about 33 million. The Netherlands is 41,000 square kilometres, including the water, and has a population of about 16.5 million. The population density of the Netherlands is approaching 400 people per square kilometre while that of Canada is 3.3. (CIA, 2008)
- 24 English translation: 'and to learn a very difficult language.'
- 25 English translation: 'I have spoken.'

References

- Abbate, J. (1999) *Inventing the Internet*. Cambridge, MA, MIT Press.
- Bakardjieva, M. (2005) *Internet Society. The Internet in Everyday Life*. London, Sage.
- Bell, D. (1973) *The Coming of Post-Industrial Society*. Basic Books, New York.
- Benjamin, W. (1936/1973) The work of art in the age of mechanical reproduction, in H. Arendt (ed.) *Walter Benjamin, Illuminations*. London, Fontana Press, pp.211-44.
- Bijker, W. (1995) *Of Bicycles, Bakelites and Bulbs. Toward a Theory of Socio-Technical Change*. Cambridge, MA, MIT Press.
- Bijker, W. and Law, J. (1993) General introduction, in W. Bijker and J. Law (eds) *Shaping Technology/Building Society. Studies in Sociotechnical Change*. Cambridge, MA, MIT Press, pp.1-14.
- Bloor, D. (1973) Wittgenstein and Mannheim on the sociology of mathematics. *Studies in History and Philosophy of Science* 4: 173-91.
- Bloor, D. (1976) *Knowledge and Social Imagery*. London, Routledge & Kegan Paul.
- Bourdieu, P. (1984) *Distinction. A Social Critique of the Judgement of Taste*. London, Routledge & Kegan Paul (trans. R. Nice).
- Broos, A. (2006) *De digitale kloof in de computergeneratie: ICT-exclusie bij adolescenten*. PhD dissertation, Katholieke Universiteit Leuven.
- CIA (Central Intelligence Agency) (2008) *CIA World Factbook*. Available online: www.cia.gov/library/publications/the-world-factbook/ (accessed 29 February 2008).
- Callon, M. (1986) Some elements of a sociology of translation: Domestication of the scallops and the fishermen of St. Brieuc Bay, in J. Law (ed.) *Power, Action and Belief: A New Sociology of Knowledge*. London, Routledge & Kegan Paul, pp.196-223.
- Castells, M. (1996-98) *The Information Age: Economy, Society and Culture*, Oxford:

Blackwell. Volume I: *The Rise of the Network Society* (1996); Volume II: *The Power of Identity* (1997); Volume III: *End of Millennium* (1998).

Castells, M. (2001) *The Internet Galaxy*. Oxford, Oxford University Press.

Certeau, M. de (1984) *The Practice of Everyday Life*. Berkeley, University of California Press (trans. S. Rendall).

College van Decanen (no date) *Regeling der Inaugurale redes van de Universiteit Maastricht*. Maastricht, Universiteit Maastricht.

Coyle, D. (1999) *The Weightless World. Strategies for Managing the Digital World*. Cambridge, MA, MIT Press.

Dijk, J. van and Nieborg, D. (2007) De opmars van de cybernauten. *De Academische Boekengids* 65: 7-10.

Dirksen, V. (2007) *Social Imaginaries of Technology and Work. A Connective Ethnography*. PhD dissertation, University of Amsterdam.

Doorn, N. van, Wyatt, S. and Zoonen, L. van (in press, 2008) A body of text: Gender and sexuality on internet relay chat. *Feminist Media Studies*, December.

Doorn, N. van, Zoonen, L. van and Wyatt, S. (2007) Writing from experience: Presentations of gender identity on weblogs. *European Journal of Women's Studies* 14(2): 143-58.

Durkheim, E. (1895/1982) *The Rules of Sociological Method*. Basingstoke, Macmillan (trans. W. Halls).

Eliot, T.S. (1940/1972) *The Waste Land and other poems*. London, Faber and Faber.

Ellison, N., Burrows, R. and Parker, S. (eds) (2007) Urban Informatics: Software, Cities and the New Cartographies of *Knowing Capitalism*, special issue of *Information Communication & Society* 10(6).

Ellul, J. (1954/1964) *The Technological Society*. New York, Random House.

Ellul, J. (1977/1980) *The Technological System*. New York, Continuum.

Franklin, M. (2004) *Postcolonial Politics, The Internet and Everyday Life*, London, Routledge.

Giddens, A. (1976/1993) *New Rules of Sociological Method*, 2nd ed. Cambridge, Polity.

Giddens, A. (1984) *The Constitution of Society*. Cambridge, Polity.

Henwood, F., Wyatt, S., Hart, A. and Smith, J. (2003) "Ignorance is bliss sometimes": Constraints on the emergence of the informed patient in the changing landscapes of health information. *Sociology of Health and Illness* 25(6): 589-607.

Innis, H. (1950) *Empire and Communications*. Oxford, Oxford University Press.

Innis, H. (1951) *The Bias of Communication*. Toronto, Toronto University Press.

Jenkins, H. (2006) *Convergence Culture. Where Old and New Media Collide*, New York, New York University Press.

Katz, J. and Aspden, P. (1998) Internet dropouts in the USA. *Telecommunications Policy* 22(4/5): 327-39.

Kennedy, H. (2005) Subjective intersections in the face of the machine. *European Journal of Women's Studies* 12(4): 471-87.

Kennedy, H. (2006) Beyond anonymity, or future directions for internet identity research. *New Media & Society* 8(6): 859-76.

Lash, S. (2002) *Critique of Information*. London, Sage.

Latour, B. (1987) *Science in Action*. Milton Keynes, Open University Press.

Latour, B. (2005) *Reassembling the Social. An Introduction to Actor-Network-Theory*. Oxford, Oxford University Press.

Lenhart, A. et al (2003) *The Ever-Shifting Internet Population: A new look at Internet access and the digital divide*. Pew Internet and American Life Project. Available online: http://www.pewinternet.org/PPF/r/88/report_display.asp (accessed 3 March 2008).

Lie, M. and Sørensen, K. (eds) (1996) *Making Technology Our Own. Domesticating Technology into Everyday Life*. Scandinavian University Press, Oslo.

MacKenzie, D. and Wajcman, J. (eds) (1985/1999) *The Social Shaping of Technology*. Milton Keynes, Open University Press.

Marx, K. (1976) [1867] *Capital, Volume 1*. Penguin Books & New Left Review, London (trans. B. Fowkes).

Marx, K. and Engels, F. (1846/1965) *The German Ideology*. London, Lawrence & Wishart.

Mols, G. (2008) Maastricht University: A full-fledged academic community. *Speeches/Redes, Opening Academic Year 07/08*, Dies Natalis 2008, Maastricht, Maastricht University, pp.19-24.

Nettleton, S. and Burrows, R. (2003) E-Scaped medicine? Information, reflexivity and health. *Critical Social Policy* 23(2): 165-85.

Nevejan, C. (2007) *Presence and the Design of Trust*. PhD dissertation, University of Amsterdam.

Oudshoorn, N. (2008) Diagnosis at a distance: The invisible work of patients and healthcare professionals in cardiac telemonitoring technology. *Sociology of Health & Illness*, 30(2): 272-88.

Oudshoorn, N. and Pinch, T. (eds) (2003) *How Users Matter: The Co-construction of Users and Technology*. Cambridge, MA, MIT Press.

Pels, D. (2003) *Unhastening Science. Autonomy and Reflexivity in the Social Theory of Knowledge*. Liverpool, Liverpool University Press.

Pinch, T. and Bijker, W. (1984) The social construction of facts and artifacts: Or how the sociology of science and the sociology of technology might benefit each other. *Social Studies of Science* 14(3): 399-441.

Pirsig, R. (1974) *Zen and the Art of Motorcycle Maintenance*. New York, Bantam Books.

Plato (1988) *Dialogen Deel 2 Phaedrus/Protagoras/lo*. Utrecht, Aula (trans. M. Schwartz).

Postman, N. (1986) *Amusing Ourselves to Death*. London, Methuen.

Quah, D. (2008) 'Weightless Economy Columns and Articles'. Available online: <http://econ.lse.ac.uk/staff/dquah/tweirlo.html#dqArea> (accessed 3 March 2008).

Riehm, U. and Krings, B.-J. (2006) Abschied vom 'Internet für alle'? Der 'blinde Fleck' in der Diskussion zur digitalen Spaltung. *Medien & Kommunikationswissenschaft* 54(1): 75-94.

Shapin, S. and Schaffer, S. (1985) *Leviathan and the Air-Pump. Hobbes, Boyle and the Experimental Life*. Princeton, Princeton University Press.

Silverstone, R. and Hirsch, E. (eds) (1992) *Consuming Technologies, Media and Information in Everyday Spaces*. London, Routledge.

Strathern, M. (2000) Afterword Accountability ... and ethnography, in M. Strathern (ed.) *Audit Cultures. Anthropological studies in accountability, ethics and the academy*. London, Routledge, pp. 279-304.

Thomas, G. and Wyatt, S. (1999) Shaping cyberspace - interpreting and transforming the Internet. *Research Policy* 28(7): 681-98.

Thompson, J. (1995) *The Media and Modernity*. Stanford, Stanford University Press.

UNDP (2007) *Human Development Report 2007/2008, Fighting Climate Change: Human Solidarity in a Divided World*, New York: United Nations Development Programme and Palgrave Macmillan. Available online: http://hdr.undp.org/en/media/hdr_20072008_en_complete.pdf (accessed 4 February 2008).

Uotinen, J. (2003) Involvement in (Information) Society - The Joensuu Community Resource Centre Netcafé. *New Media & Society* 5(3): 335-56.

Wathen, C.N. (2006a) Alternatives to hormone replacement therapy: A multi-method study of women's experiences. *Complementary Therapies in Medicine* 14(3): 185-92.

Wathen, C.N. (2006b) Health information seeking in context: How women make decisions regarding hormone replacement therapy. *Journal of Health Communication* 11: 477-93.

Wathen, C.N., Wyatt, S. and Harris, R. (eds) (in press, 2008) *Mediating Health Information: The Go-Betweens in a Changing Socio-Technical Landscape*. Houndmills, Palgrave Macmillan.

Webster, A. (ed.) (2006) *New Technologies in Health Care*. Houndmills, Palgrave Macmillan.

Williams, R. (1976) *Keywords. A Vocabulary of Culture and Society*. London, Fontana.

Witschge, T. (2007) *In/difference Online: The Issue of Immigration on the Internet*. PhD dissertation, University of Amsterdam.

Woolgar, S. (2002) Five rules of virtuality, in S. Woolgar (ed.) *Virtual Society? Technology, Cyberpole, Reality*. Oxford, Oxford University Press, pp.1-22.

Wouters, P. and Beaulieu, A. (2006) Imagining e-science beyond computation, in C. Hine (ed.) *New Infrastructures for Knowledge Production: Understanding E-Science*. London, Information Science Publishing, pp. 48-70.

Wyatt, S. (2008) Technological determinism is dead; Long live technological determinism, in E. Hackett, O. Amsterdamska, M. Lynch and J. Wajcman (eds) *Handbook of Science and Technology Studies*. Cambridge, MA, MIT Press, pp.165-80.

Wyatt, S. and Henwood, F. (2006) 'The best bones in the graveyard': Risky technologies and risks in knowledge, in C. Timmerman and J. Anderson (eds) *Devices and Designs: Medical Innovation in Historical Perspective*. Houndmills, Palgrave Macmillan, pp.231-48.

Wyatt, S., Henwood, F., Hart, A. and Smith, J. (2005) The digital divide, health information and everyday life. *New Media & Society*, 7(2): 199-218.

Wyatt, S., Thomas, G. and Terranova, T. (2002) They came, they surfed, they went back to the beach: Conceptualising use and non-use of the Internet, in S. Woolgar (ed.) *Virtual Society? Technology, Cyberbole, Reality*. Oxford, Oxford University Press, pp.23-40.